CLAIMS

What is claimed is:

1. A video encoder comprising:

a motion estimator to perform a motion search on input video data relative to a reference video frame to generate a plurality of motion vectors, the motion search comprises a rectangular motion search; and

a variable length coder to compress the input video data using the motion vectors.

2. The video encoder of claim 1, further comprising:

a transformer to transform the input video data in real-domain; and

a quantization unit to quantize the transformed video data.

3. The video encoder of claim 1, further comprising a frame memory, coupled to the motion estimator, to store the reference frame.

4. A method comprising:

performing a motion search on input video data relative to a reference video frame to generate a plurality of motion vectors, the motion search comprises a rectangular motion search; and

compressing the input video data using the motion vectors.

5. The method of claim 4, further comprising:

transforming the input video data in real-domain; and

quantizing the transformed video data.

6. The method of claim 4, further comprising storing the reference frame.

7. A method to determine relative movement of a pixel block from a first video frame to a second video frame, the method comprising:

performing a motion measurement on a plurality of motion search points that form a rectangular search region;

finding a minimal motion search point among the plurality of motion search points based on result of the motion measurement; and

finding a motion vector corresponding to the relative movement of the pixel block from the first video frame to the second video frame if the minimal motion search point is within an inner region of the rectangular search region.

8. The method of claim 7, further comprising:

repositioning the rectangular search region to be substantially centered on the minimal motion search point and partially overlapping the rectangular search region if the minimal motion search point is along an edge or at a corner of the rectangular search region, the repositioned rectangular search region including a second plurality of motion search points; and

performing a motion measurement on the second plurality of motion search points.

9. The method of claim 8, wherein the motion measurement on the second plurality of motion search points excludes the one or more of the plurality of motion search points falling within both the rectangular search region and the repositioned rectangular search region.

10. The method of claim 7, further comprising:

dividing the rectangular search region into a plurality of data units, each of the plurality of data units having substantially the same size and a distinct subset of the plurality of motion search points, wherein the motion measurement is performed in each of the plurality of data units one by one.

11. The method of claim 10, wherein the rectangular search region is a square search region having 16 motion search points.

12. The method of claim 11, wherein the square search region is divided into 4 data units, each of the 4 data units has 4 distinct motion search points.

13. The method of claim 7, further comprising performing a refinement motion search, wherein performing the refinement motion search comprises shrinking the rectangular search region at the minimal point if the minimal motion search point is within the inner region of the rectangular search region.

14. The method of claim 7, further comprising performing a sub-pixel motion search around the minimal point if the minimal motion search point is within an inner region of the rectangular search region.

15. A method to compress video data comprising:

defining a first video frame as a reference video frame;

performing a motion search on a second video frame relative to the reference video frame to determine a plurality of motion vectors of the second video frame relative to the reference video frame; and

reducing the video data to the reference video frame and the plurality of motion vectors of the second video frame, wherein the motion search includes

performing motion measurement on a plurality of motion search points that form a rectangular search region within a pixel block;

finding a minimal motion search point among the plurality of motion search points based on result of the motion measurement; and

finding a motion vector corresponding to the relative movement of the pixel block from the first video frame to the second video frame if the minimal motion search point is within an inner region of the rectangular search region.

16. The method of claim 15, wherein performing the motion search further comprises:

repositioning the rectangular search region to be substantially centered on the minimal motion search point and partially overlapping the rectangular search region if the minimal motion search point is along an edge or at a corner of the rectangular search

region, the repositioned rectangular search region including a second plurality of motion search points; and

performing a motion measurement on the second plurality of motion search points.

17. The method of claim 16, wherein the motion measurement on the second plurality of motion search points excludes the one or more of the plurality of motion search points falling within both the rectangular search region and the repositioned rectangular search region.

18. The method of claim 15, wherein performing the motion search further comprises:

dividing the rectangular search region into a plurality of data units, each of the plurality of data units having substantially the same size and a distinct subset of the plurality of motion search points, wherein the motion measurement is performed in each of the plurality of data units one by one.

19. A machine-accessible medium that provides instructions that, if executed by a processor, will cause the processor to perform operations to determine relative movement of a pixel block from a first video frame to a second video frame, the operations comprising:

performing a motion measurement on a plurality of motion search points that forms a rectangular search region within the pixel block;

finding a minimal motion search point among the plurality of motion search points based on result of the motion measurement; and

finding a motion vector corresponding to the relative movement of the pixel block from the first video frame to the second video frame if the minimal motion search point is within an inner region of the rectangular search region.

20. The machine-accessible medium of claim 19, wherein the operations further comprise:

repositioning the rectangular search region to be substantially centered on the minimal motion search point and partially overlapping the rectangular search region if the minimal motion search point is along an edge or at a corner of the rectangular search region, the repositioned rectangular search region including a second plurality of motion search points; and

performing a motion measurement on the second plurality of motion search points.

21. The machine-accessible medium of claim 20, wherein the motion measurement on the second plurality of motion search points excludes the one or more of the plurality of motion search points falling within both the rectangular search region and the repositioned rectangular search region.

22. The machine-accessible medium of claim 19, wherein the operations further comprise:

dividing the rectangular search region into a plurality of data units, each of the plurality of data units having substantially the same size and a distinct subset of the plurality of motion search points, wherein the motion measurement is performed in each of the plurality of data units one by one.

23. The machine-accessible medium of claim 22, wherein the rectangular search region is a square search region having 16 motion search points.

24. The machine-accessible medium of claim 23, wherein the square search region is divided into 4 data units, each of the 4 data units has 4 distinct motion search points.

25. A system comprising:

a dynamic random access memory (DRAM) device;

a memory controller coupled to the DRAM device; and

a parallel processor chip coupled to the memory controller, the parallel processor chip comprising

a plurality of registers defining a register file; and

a parallel processor coupled to the plurality of registers, wherein the parallel processor is operable to perform operations to determine relative movement of a pixel block from a first video frame to a second video frame, the operations comprising:

performing a motion measurement on a plurality of motion search points that form a rectangular search region within the pixel block;

finding a minimal motion search point among the plurality of motion search points based on result of the motion measurement; and

finding a motion vector corresponding to the relative movement of the pixel block from the first video frame to the second video frame if the minimal motion search point is within an inner region of the rectangular search region.

26. The system of claim 25, wherein the operations further comprise:

repositioning the rectangular search region to be substantially centered on the minimal motion search point and partially overlapping the rectangular search region if the minimal motion search point is along an edge or at a corner of the rectangular search region, the repositioned rectangular search region including a second plurality of motion search points; and

performing a motion measurement on the second plurality of motion search points.

27. The system of claim 26, wherein the motion measurement on the second plurality of motion search points excludes the one or more of the plurality of motion search points falling within both the rectangular search region and the repositioned rectangular search region.

28. The system of claim 25, wherein the parallel processor loads a plurality of data elements into a rectangular region within the register file, the rectangular region corresponding to the rectangular search region.

29. The system of claim 25, further comprising a microprocessor coupled to the memory controller.